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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,856	01/10/2002	Peter Selmeier	P01,0534	8833

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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/030,856

Applicant(s)

Selmeier

Examiner

Baikun Summons

Group Art Unit

2017

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 1/10/02 (Pre-Amdt, Sub-spec)
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 8-18 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 8-10 and 12-18 is/are rejected.
- ☒ Claim(s) 11 is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The drawing(s) filed on 1/10/02 is/are objected to by the Examiner
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☒ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 3
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR § 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the case wherein “the electric connection” (i.e. of the ground sides of the first and further first SAW resonators) “comprises a bond (wire) connection between two pads on the substrate”, as recited in claim 10, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
2. Figures 1-11B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see e.g. the discussion of these figures in the spec. at pgs. 1-4, especially page 3, section [0016], the first mention of an inventive filter being Fig. 12 as mentioned at page 8, line 13 and page 9, section [0040]). See MPEP § 608.02(g).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The substitute specification received 1/10/02 has been approved and entered.
4. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: antecedent basis for the claimed limitation that “the overall filter size is smaller than or equal to 2.5 x 2.0 mm²” as recited in claim 14, must be added to the specification.

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Claim Objections

5. Claims 8, 10-13, and 15-18 are objected to because of the following informalities:

In claim 8, on line 13, the Examiner suggests that “configured to be” be deleted because it is a meaningless non-positive limitation indicating something that may, but is not required to, happen in the future. That is, any two things are “configured to be connected” if they can possibly be connected, regardless of whether or not they actually are connected.

In claim 8, on the last line thereof, “saw” should be changed to the all capitals --SAW--.

In claim 10, on line 2, for clarity the Examiner suggests “bond” be followed by --wire-- (see the spec. pg. 19, ln. 8), since a stripline can also be considered a “bond” between two pads.

In claim 11, on line 2, “further” should be followed by --first-- (see claim 8, ln. 5).

In claim 11, on line 4, it appears that “the first” should be changed to --the other of the first and the further first SAW-- (see lines 2-3 and Fig. 28 or Fig. 25).

In claim 12, on line 2, it appears that “at least two parallel” should be --the first and further first SAW-- (see claim 8, lns. 11-13).

In claim 12, on line 3, the Examiner suggests “bond” be followed by --wire--.

In claim 13, on line 2, the Examiner suggests that meaningless non-positive limitation, “configured to be”, be deleted (see the similar objection to claim 8 above).

In claim 15, on the last line thereof, for clarity the Examiner suggests changing “identical” to --constant-- (see e.g. the spec. at pg. 12, sections [0074] through [0080]), because “identical” begs the question ‘identical to what?’.

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Similarly, in claim 16, on the last line thereof, the Examiner suggests changing "identical" to --constant--.

In claim 17, on line 2, either "a further first" should be --the further first--, or if this is not necessarily the "further first SAW resonator" with the different static capacitance of claim 8, then another word should be used such as --an additional first-- or --another first--.

In claim 18, on line 2, "and" should be deleted.

In claim 18, on line 3, "further" should be followed by --first--; "that that" should be changed to --that--; and the last word of the line "a" should be --the--.

In claim 18, on the last line thereof, the Examiner suggests that "identical" be replaced with --constant--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 12 and 14-18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites that "the housing link... comprises a bond connection" (i.e. bond wire connection) which is totally incompatible with the previously recited housing link "bump

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connection” (see claim 8, lns. 15-16)[see also Fig. 30 vs. Fig. 31]. Thus, the claim is rendered unclear as to what type of housing link connection is being recited.

Claim 14 recites the limitation “the overall filter size...” which is unclear because of the non-positive limitation in claim 13. That is, since the filter of claim 13 is only “configured to be installed in a housing” and not necessarily is installed, it is unclear whether the “size” in claim 14 includes just the filter chip or both the filter chip and the housing.

Regarding Claims 15-18: A single claim which claims both an apparatus and the method steps of using (i.e. operating) the apparatus is indefinite under 35 U.S.C. 112, second paragraph. In *Ex parte Lyell*, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990), a claim directed to an automatic transmission workstand and the method steps of using it was held to be ambiguous and properly rejected under 35 U.S.C. 112, second paragraph. The basic gist of the decision being that the metes and bounds of protection cannot be determined because such a claim would raise serious questions for the manufacturer of the device regarding infringement since the manufacturer would have no indication if a buyer/user would perform the claimed method of using/operating the device.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 8-10, 12, and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Taniguchi et al. U.S. 6,150,904 in view of Ushiroku et al. U.S. 6,137,380.

Figs. 1 and 13 of Taniguchi et al. disclose a surface acoustic wave (SAW) filter comprising: a first SAW resonator P2 in a parallel branch of the filter that inherently has a static capacitance [i.e. based on the number of electrode fingers in the interdigital transducer (IDT), the wavelength/electrode finger spacing, and the electrode finger overlap lengths]; a further first SAW resonator P3 in a further parallel branch of the filter that inherently has a static capacitance; a second SAW resonator S1 in a serial branch of the filter that inherently has a static capacitance; at least one basic element (i.e. an L-shaped element with a series and a parallel resonator and with the same arrangement and number of basic elements as Applicant's Fig. 19) comprising the first SAW resonator P2 and the second SAW resonator S1 formed on a piezoelectric substrate 10; an electrical connection of ground sides of the first SAW resonator P2 and the further first SAW resonator P3 and comprised of a "bond connection" stripline 23 (Fig. 13) between two pads (not numbered) on the substrate 10 that is made before bonding to a housing 7 that contains the filter; and wherein the static capacitance of the first SAW resonator P2 appears to be different from (i.e. much larger than) that of the further first SAW resonator P3 due to the large difference in the overlap length of the electrode fingers of their corresponding IDTs (Fig. 13). Regarding claim 12, the housing link of the electrically connected ground sides of the resonators P2 and P3, i.e., the connection of the stripline 23 to the housing 7, is made by a bond wire connection (see wire 12e in Fig. 13).

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However, Taniguchi et al. does not explicitly state that the static capacitance of the first SAW resonator P2 in the center of the ladder filter is different from (i.e. larger than) that of the SAW resonator P3, and does not show a bump connection for flip-chip mounting being provided on the stripline 23 that is the housing link as shown, for example, in Applicant's Fig. 30.

Ushiroku et al., which is analogous art and has the same inventors, discloses a ladder filter with the same layout of the resonators (see Fig. 5) and explicitly states that the center parallel resonator 25 has more electrode fingers and a greater electrode finger overlap length (see col. 7, Table 1), thereby providing a larger different static capacitance than the other parallel resonators. Additionally, Ushiroku et al. discloses that wire bonding the SAW filter to the housing (see Fig. 13) and bump bonding the SAW filter to the housing (see Fig. 41) are known alternate interchangeable structures for mounting and electrically connecting the SAW filter of each of its previously described embodiments in the housing (see col. 20, lns. 28-51).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Taniguchi et al. (Fig. 13), if even necessary, such that the first SAW center parallel resonator P2 would have had a static capacitance different from the further SAW parallel resonator P3 because the exemplary teaching thereof by Ushiroku et al. (see Fig. 5 and col. 7, Table 1) provides evidence that such a SAW ladder filter structure would have been a standard well known filter in the art, and because Taniguchi et al. suggests such a structure by the different sizes of the IDTs in Fig. 13. It would have been equally obvious to one of ordinary skill in the art at the time the invention was made to

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have replaced the bond wire connection 12e and all other wires of Taniguchi et al. (Fig. 13) with flip-chip mount bumps on housing link/stripline 23 and the other connection points, because such an obvious modification would have been a mere alternate interchangeable structure for mounting SAW filters in housings as suggested by Ushiroku (Fig. 41 and col. 20, lns 28-51).

Allowable Subject Matter

10. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 14-18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11, the prior art of record does not disclose or fairly suggest a SAW filter having each of the specifically recited features and also wherein "the further SAW resonator is divided into two individual parallel resonators" connected as recited. Regarding the method of operating claims, if the claims were rewritten to be only method claims and not also apparatus claims, it appears that the method would be allowable over the prior art of record which does not

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disclose shifting a pole point of a SAW filter by raising or lowering the static capacitance of one parallel resonator and then doing the other of raising or lowering the static capacitance of another parallel resonator so that the total static capacitance of the parallel resonators remains constant (see claim 15).

The Examiner can not make a patentability determination on claim 14 at this time since it is unclear if the recited size is only the SAW filter chip or the chip and the housing.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kuroda et al. JP 9-261002 discloses image frequency rejection (see the discussion of the prior art in Ikada U.S. 6,369,672 cited below) lower than the passband of a SAW ladder filter by connecting the grounds of two parallel resonators 12d and 12e (see Figs. 1-3) together on the substrate by conductive connection 13e.

Plessky et al. U.S. 5,945,893 (see e.g. Figs. 2, 3a and 4a); Seki et al. U.S. 5,506,552 (see 25b in Fig. 2); and Noguchi JP 9-167937 (see 54-4 in Figs. 2, 6, and 8) each show an electrical connection, on the piezoelectric substrates, of the grounds of parallel resonators in SAW ladder filters.

Ushiroku U.S. 5,999,069 discloses distributing the pole points of a SAW ladder filter by using parallel resonators with different static capacitances and different length bond wires (see the abstract).

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Kobayashi et al. U.S. 5,877,662 discloses dividing parallel resonators in a SAW ladder filter into two resonators coupled in parallel (see e.g. Figs. 10-12).

Hashimoto U.S. 5,914,646 discloses providing some parallel resonators having a much larger static capacitance than others in SAW ladder filters (see e.g. Figs. 5 and 6 and the abstract).

Flowers et al. U.S. 6,246,148 discloses a SAW ladder filter providing image frequency rejection (see Figs. 7 and 8) by providing the grounds of all of the parallel resonators be connected and by making all of the parallel resonators have different characteristics (see e.g. the abstract, col. 2, lns. 48-65, and col. 4, lns. 7-13), and discloses flip-chip mounting (col. 2, lns. 30-37).

Ikada U.S. 6,369,672 discloses a SAW ladder filter (see Figs. 3, 5, 6, 8, and 10 etc.) with image frequency rejection (see col. 3, lns. 13-26) provided by the capacities of the IDTs of the parallel resonators and the inductances of bonding wires. However, the date does not precede applicant's earliest effective filing date.

14. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.



Barbara Summons
Primary Examiner
Art Unit 2817

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March 28, 2003